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FACULTY OF ENGINEERING & TECHNOLOGY

Course: B. Tech Biotechnology
Sub Code: BBT-515

Semester: 5th
Sub Name: Plant Biotechnology

LECTURE 8

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6. Hardening:

-Is the gradual exposure of plantlets for acclimatisation to environmental condition

7. Plantlet transfer:

-Plantlet are transferred to green house or field conditions.

Overview of Plant Tissue Culture

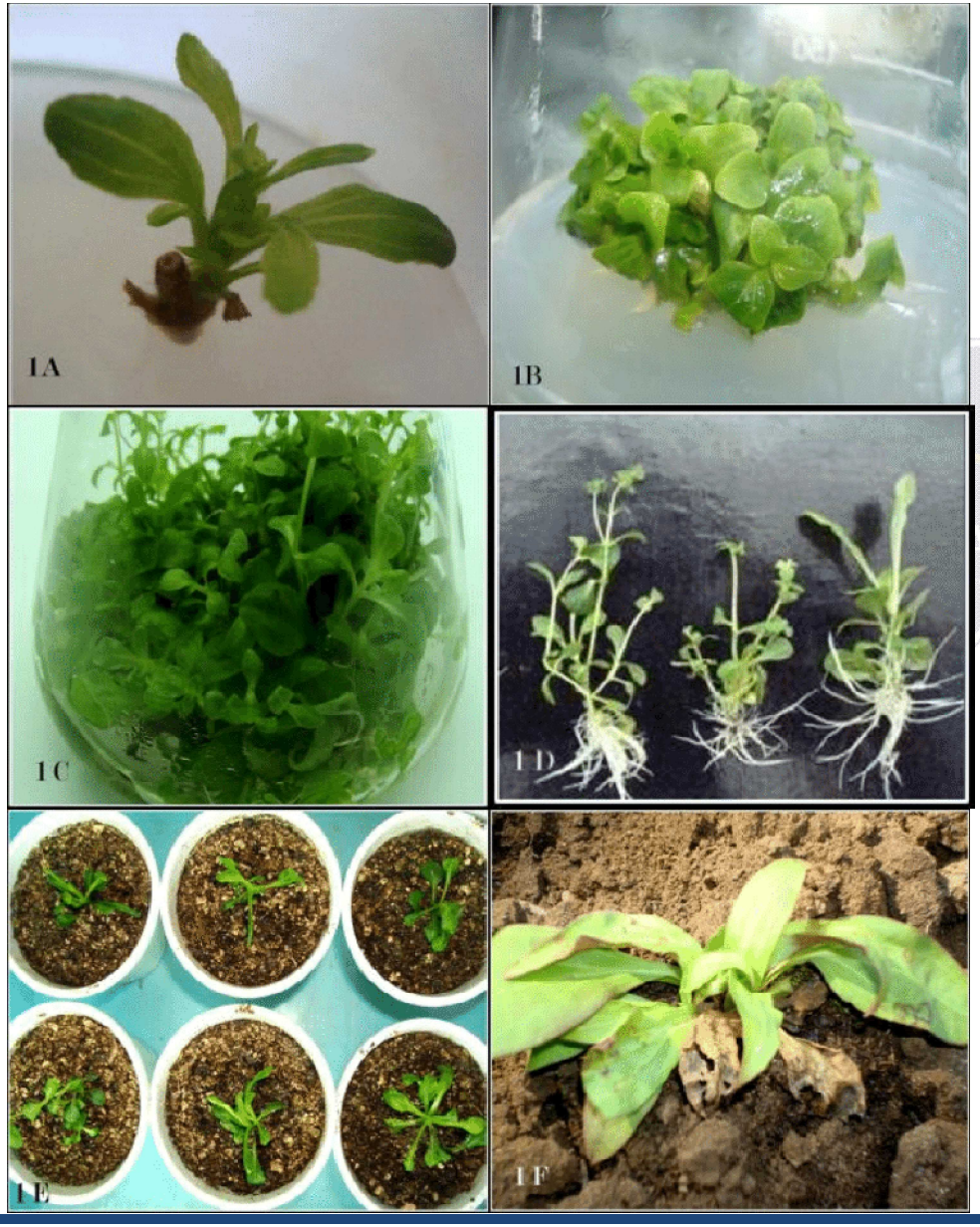

Figure: *In vitro* regeneration of *Swertia chirayita* from nodal explants:

A - initiation of culture

B and **C**- multiple shoots formation

D- rooting of regenerated shoots

E and **F** - hardened plantlets in sterile soil, sand and vermiculite mixture

Sharma, V., Belwal, N., Kamal, B., Dobriyal, A.K. and Jadon, V.S., 2016. Assessment of genetic fidelity of in vitro raised plants in Swertia chirayita through ISSR, RAPD analysis and peroxidase profiling during organogenesis. Brazilian Archives of Biology and Technology, 59.

Basis of Plant Tissue Culture

- Two Hormones Affect Plant Differentiation:

– Auxin: Stimulates Root Development

– Cytokinin: Stimulates Shoot Development

- Generally, the ratio of these two hormones can determine plant development:

– ↑ Auxin ↓Cytokinin = Root Development

– ↑ Cytokinin ↓Auxin = Shoot Development

– Auxin = Cytokinin = Callus Development

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Factors affecting Plant Tissue Culture

✓ Growth Media
– Minerals, Growth factors, Carbon source, Hormones

✓ Environmental Factors
– Light, Temperature, Photoperiod, Sterility, Media

✓ Explant Source
– Usually, the younger, less differentiated the explant, the better for tissue culture

✓ Genetics
– Different species show differences in amenability to tissue culture
– In many cases, different genotypes within a species will have variable responses to tissue culture; response to somatic embryogenesis has been transferred between melon cultivars through sexual hybridization

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